Space Weather Forecast

Issued on Thursday, 16 March 2023 at 12:56 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of a G1/Minor Geomagnetic storm on Day 1 (16 March).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24-hours with two isolated Common-class flares, one of which emanated from a region that is yet to emerge onto the Earth-facing disc. There are currently ten sunspot regions on the visible disc. These are a mixture of mature spots and some more recently emerged spot groups. All are small and magnetically simple and are generally either stable or in decay.
No Earth directed CME's have been observed in the past 24-hours.

Solar Wind / Geomagnetic Activity: The solar wind has remained at or close to elevated levels throughout the last 24-hours with ongoing enhancement attributed to coronal mass ejection arrivals at Earth on 15 Mar and a stream of fast winds from a coronal hole. The important north-south component fluctuated north/south with moderate strength, and a sustained period of southward orientation was observed 15/2000-2130UTC. Geomagnetic activity ranged Quiet to G2/Moderate Storm, with a G2/Moderate Storm interval observed at 15/2100-2400UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has remained at background to slightly elevated levels throughout.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain Low or Very Low, with a slight chance of an isolated Moderate-class flare, most probable on Days 3-4 (18-19 Mar).

Solar Wind / Geomagnetic Activity: Solar winds are expected to remain at elevated or slightly elevated levels through Days 1-2 (16-17 Mar) due to the combined effects of coronal hole fast winds and the waning influence of coronal mass ejections that arrived at Earth on 15 Mar. Wind speeds continuing to decline through Days 1-2, but weak enhancement is possible by the end of Day 4 (19 Mar) as a further stream of fast winds from a coronal hole connection may arrive.
Geomagnetic conditions forecast to be largely Quiet with some Unsettled intervals. Slight chance of Active intervals and of a G1/Minor Storm interval Day 1 (16 Mar). Possible further upturn in activity to Unsettled to Active by the end of the period, with a slight chance of a G1/Minor Storm interval.

Energetic Particles / Solar Radiation: The count rate of energetic particles is expected to remain at or near background levels. No further significant enhancements are expected at present.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	20	5	1	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	5	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	5	1	1	1
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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